



P.O. Box 10640 Bozeman, Montana 59719

(406) 460-0903

TO: Jim Griswold, NMOCD

FROM: Curtis Shuck, Chairman

DATE: April 29, 2023

RE: Fowler Hair #005 (30-025-11107) Orphan Well Post-Plugging Methane Monitoring

TECHNICAL MEMORANDUM

Well Done New Mexico LLC and the Well Done Foundation, Inc. (WDF) performing contract professional services methane monitoring for the State of New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD) under Purchase Order #52100-00000073975 for Orphan Oil & Gas Wells in Lea County, NM.

The site conditions found at the Fowler Hair #005 by the WDF Measure 1 Field Team on January 17, 2023, revealed an orphan wellbore with cement to within -27" of the wellhead. The WDF Measure 1 Team took site photographs, performed field gas measurements, and collected a gas sample for immediate laboratory analysis.

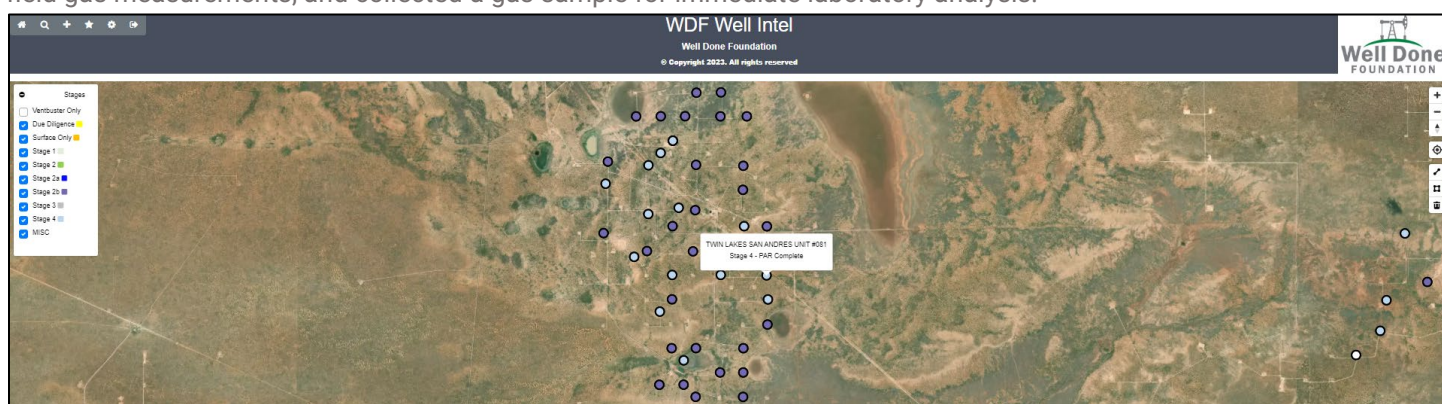


Image 1.1 – Fowler Hair #005 (30-025-11107) Orphan Well in Lea County, NM

The Pre-Plugging Methane Flow Monitoring Test on November 12, 2022, using Ventbuster™ Instruments VB100-052 Ultra-Low Flow Meter with GPS, resulted in 0.00 cubic meters per day of total measured wellhead emissions. A composite gas sample collected at the wellhead by WDF during the flow test established a methane gas concentration level measured at 4,160 ppm, pursuant to Test ID 2022060199 performed by Laboratory Services of Hobbs, NM. Therefore, the adjusted average methane gas emission measured at this wellhead is calculated at **0.00 grams per hour (g/hour)**.¹

The State of New Mexico used the methane flow data collected by WDF to prioritize the Fowler Hair #005 orphan well plugging under the IJJA Program and began mobilizing a contractor to location. A-Plus Well Service, Inc. of Farmington, NM was awarded the plugging contract.

WDF arrived at the Fowler Hair #005 location on January 17, 2023, to perform post-plugging orphan well methane testing and sampling on behalf of the State of New Mexico. **WDF post plugging field gas tests revealed 0.00% of methane or H2s gasses. The post plugging collected gas samples, analyzed by Laboratory Services, Inc. confirmed 0.00 ppm or methane gas and 0.00 ppm of H2s gas. THEREFORE, the total Methane Gas Emissions Reduction is: 0.00 g/hour.**

¹ Methane Calculation: 717 grams CH₄ per cubic meter (717 x 0.00 m³/day = 0.00 g/day total /24 = 0.00 g/hour x 0.004160 (methane concentration) = **0.00 g/hour CH₄**). **Methane, gas** weighs 0.000717 gram per cubic centimeter or 0.717 kilogram per cubic meter, i.e. density of methane, gas is equal to 0.717 kg/m³; at 0°C (32°F or 273.15K) at standard atmospheric pressure. In Imperial or US customary measurement system, the density is equal to 0.044 pound per cubic foot [lb/ft³].

This orphan well did not exceed the >1 g/hour federal program reporting requirements for methane emissions reductions as described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58)².

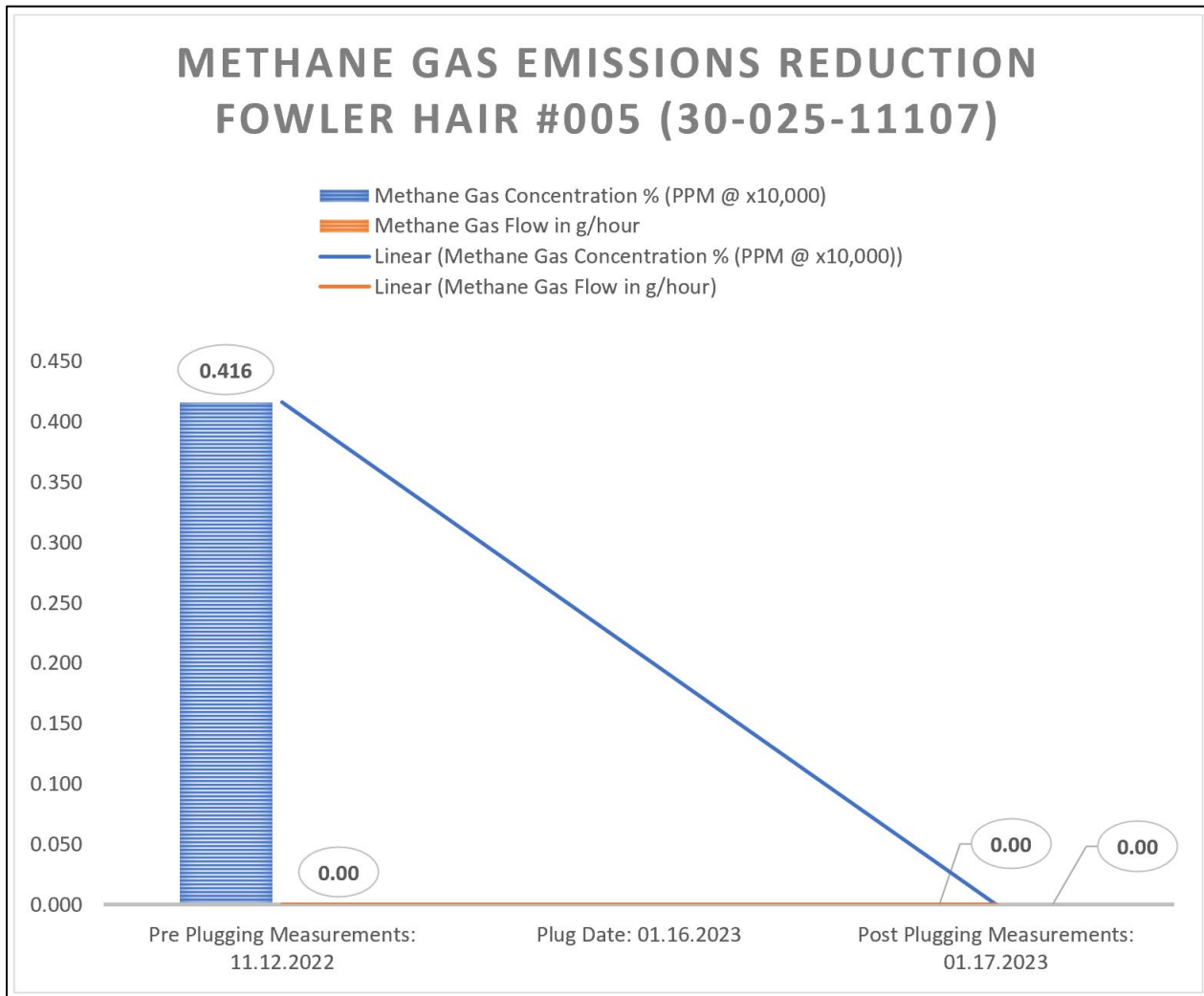


Image 2.1 – Fowler Hair #005 (30-025-11107) Methane Gas Emissions Reduction Pre Plugging to Post Plugging

TECHNICAL FINDINGS

Fowler Hair #005 (30-025-11107):


- **Total C1 through C6 Gas Concentration: 26,510 ppm**
- **Total Measured Wellhead Gas Emissions: 0.00 m³/day**
- **Methane Gas Concentration: 4,160 ppm**
- **Calculated Average Wellhead Methane Gas Emissions: 0.00 g/hour**
- **Post Plugging Methane Gas Concentration: 0.00 ppm**
- **Post Plugging Methane Flow: 0.00 g/hour**

² These April 11, 2022 Guidelines were developed to meet the federal program reporting requirements for methane emissions reductions as described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58).

CONCLUSIONS

- The Fowler Hair #005 (30-025-11107) was emitting Methane gas pre-plugging at the average rate of 0.00 g/hour, which was below the Federal minimum threshold for reporting described in Section 40601 (Orphaned well site plugging, remediation, and restoration) of Title V (Methane Reduction Infrastructure) of the 2021 Bipartisan Infrastructure Law (BIL; Public Law 117-58) which is >1g/hour.
- Post Plugging, the Fowler Hair #005 (30-025-11107) presented 0.00 ppm of Methane gas emissions from field gas tests and laboratory analysis of WDF collected gas samples.

FIELD NOTES



Well Site

[Info](#) [Well File](#) [Images](#) [Well Data](#) [Regulatory](#) [Field Notes](#) [Live Data View](#) [Access](#) [Remove Well](#)

Date04/29/2023

New Noteces: Prepare Post Plugging Tech Memorandum - WILDCAT OUT!Add

#	Date	Note
1	2023-01-17	ces: On location to collect post plugging samples and photo document. Field gas analysis indicates non-detect for CH4. Secure location and transport post plugging samples to Lab for analysis.
2	2022-11-13	ces: FV returned to location to stop the Methane Flow Test and Rig Down VB100-52. Secured location.
3	2022-11-12	ces: On location w/Measure1. Site photos, field gas samples, Lab Gas Samples. Rig up VB100-52 for 12-Hour Methane Flow Test. Good Test start.

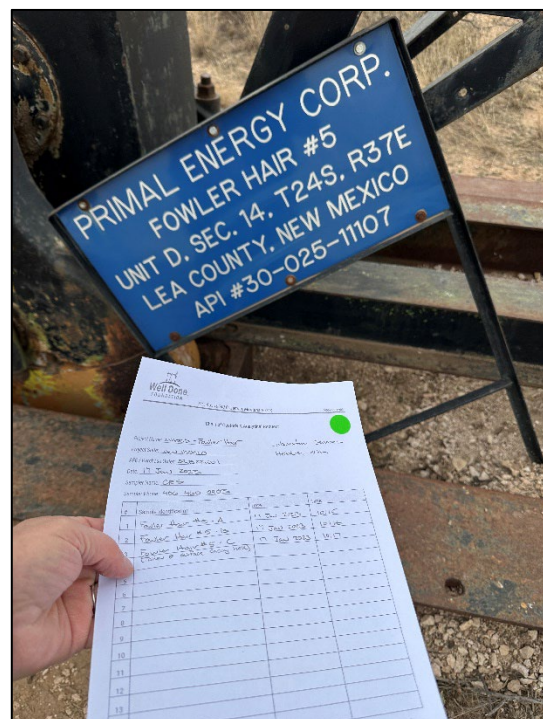
Image 3.1 – Fowler Hair #005 (30-025-11107) Field Notes from WDF Well Intel™ Orphan Well Project Management IoT



1) Fowler Hair #005 – Cement Level at Wellhead



2) Fowler Hair #005 – Post Plug Gas Sample



3) Fowler Hair #005 – Chain of Custody



4) Fowler Hair #005 – Post Plug Green Ribbon



www.permianls.com
575.397.3713 2609 W Marland Hobbs NM 88240

C6+ Gas Analysis Report

15735G	Fowler Hair #5 A Post Plug	Fowler Hair #5 A Post Plug	
Sample Point Code	Sample Point Name	Sample Point Location	
Laboratory Services	2023062777	Tedlar Bag	CES - Spot
Source Laboratory	Lab File No	Container Identity	Sampler
USA	USA	USA	New Mexico
District	Area Name	Field Name	Facility Name
Jan 17, 2023 10:15	Jan 17, 2023 10:15	Jan 17, 2023 13:34	Jan 17, 2023
Date Sampled	Date Effective	Date Received	Date Reported
Torrance			
Ambient Temp (°F)	Flow Rate (Mcf)	Analyst	Press PSI @ Temp °F Source Conditions
Well Done Foundation		NG	
Operator		Lab Source Description	

Component	Normalized Mol %	Un-Normalized Mol %	GPM
H2S (H2S)	0.0000	0	
Nitrogen (N2)	97.7870	97.78661	
CO2 (CO2)	0.0370	0.0372	
Methane (C1)	0.0000	0	
Ethane (C2)	0.0180	0.01822	0.0050
Propane (C3)	0.0300	0.02984	0.0080
I-Butane (IC4)	0.0100	0.01007	0.0030
N-Butane (NC4)	0.0460	0.04608	0.0140
I-Pentane (IC5)	0.0000	0	0.0000
N-Pentane (NC5)	0.0790	0.07908	0.0290
Hexanes Plus (C6+)	1.9930	1.99289	0.8650
TOTAL	100.0000	100.0000	0.9240

Method(s): Gas C6+ - GPA 2261, Extended Gas - GPA 2286, Calculations - GPA 2172

Analyzer Information			
Device Type:	Gas Chromatograph	Device Make:	Shimadzu
Device Model:	GC-2014	Last Cal Date:	Jan 3, 2023

Source	Date	Notes
Brooke Rush	Jan 18, 2023 11:45 am	Methane = 0 PPM

Gross Heating Values (Real, BTU/ft³)			
14.696 PSI @ 60.00 Å°F	14.73 PSI @ 60.00 Å°F		
Dry	Saturated	Dry	Saturated
108.7	107.7	109.000	107.9

Calculated Total Sample Properties	
GPA2145-16 *Calculated at Contract Conditions	
Relative Density Real	Relative Density Ideal
1.0145	1.0143
Molecular Weight	
29.3752	

C6+ Group Properties		
Assumed Composition		
C6 - 60.000%	C7 - 30.000%	C8 - 10.000%

Field H2S
0 PPM

PROTREND STATUS:

Passed By Validator on Jan 18, 2023

DATA SOURCE:

Imported

PASSED BY VALIDATOR REASON:

First sample taken @ this point, composition looks reasonable

VALIDATOR:

Brooke Rush

VALIDATOR COMMENTS:

OK

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

DEFINITIONS

Action 295393

DEFINITIONS

Operator: PRIMAL ENERGY CORPORATION 211 Highland Cross Houston, TX 77073	OGRID: 154303
	Action Number: 295393
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

DEFINITIONS

The Orphan Well Mitigation Activity (OMA) forms are a subset of the OCD's forms exclusively designed for activities related to State of New Mexico's contracted plugging and reclamation activities. Specifically, these forms are used for orphan wells or associated facilities which are in a "Reclamation Fund Approved" status. This status represents wells or facilities where the OCD has acquired a hearing order allowing the OCD to perform plugging or reclamation on wells and associated facilities that no longer have a viable operator to perform the necessary work. These forms are not to be utilized for any other purpose.

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QUESTIONS

Action 295393

QUESTIONS

Operator: PRIMAL ENERGY CORPORATION 211 Highland Cross Houston, TX 77073	OGRID: 154303
	Action Number: 295393
	Action Type: [UF-OMA] Post-Plug Methane Monitoring (UF-OMA-MMB)

QUESTIONS

Prerequisites	
[OGRID] Well Operator	[154303] PRIMAL ENERGY CORPORATION
[API] Well Name and Number	[30-025-11107] FOWLER HAIR #005
Well Status	Plugged (not released)

Monitoring Event Information*Please answer all the questions in this group.*

Reason For Filing	Post-Plug Methane Monitoring
Date of monitoring	01/17/2023
Latitude	32.22195
Longitude	-103.14125

Monitoring Event Details*Please answer all the questions in this group.*

Flow rate in cubic meters per day (m³/day)	0.00
Test duration in hours (hr)	1.0
Average flow temperature in degrees Celsius (°C)	4.0
Average gauge flow pressure in kilopascals (kPag)	0.0
Methane concentration in part per million (ppm)	0
Methane emission rate in grams per hour (g/hr)	0.00
Testing Method	Steady State

Monitoring Contractor*Please answer all the questions in this group.*

Name of monitoring contractor	Well Done New Mexico LLC
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